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Investor sentiment and closed-end fund puzzle in an emerging market

Z. Nuray Güner*
Middle East Technical University, Department of Business Administration, İnönü Bulvarı, Ankara 06531 Turkey
e-mail: nguner@ba.metu.edu.tr

Zeynep Önder
Bilkent University, Faculty of Business Administration, Bilkent, Ankara 06800 Turkey
e-mail: zonder@bilkent.edu.tr

Abstract

This paper examines the closed-end fund puzzle in the Istanbul Stock Exchange. Closed-end funds are found to be trading at a discount in this market as well but the size of the discount on Turkish closed-end funds is much larger. Findings of this paper provide partial support for the investor sentiment hypothesis. Contrary to the findings for mature exchanges, investor sentiment does not seem to have a significant effect on the largest ten percent of stocks in this market. These stocks could be safe bets for investors who do not want to be affected from the sentiment of local investors.

Keywords: Closed-end fund puzzle, Investor sentiment.
JEL classification: G12.

1. Introduction

Closed-end funds are investment companies which form a portfolio of publicly traded securities and then issue claims on the portfolios that they created. These claims are traded on organized exchanges. Since there is a well-functioning secondary market for publicly traded securities, it should be very easy to price holdings of the closed-end funds. Therefore, the stock price of a closed-end fund is expected to be equal to the net asset value (NAV) of its portfolio. However, empirical findings for developed markets show that stocks of closed-end funds trade, in general, at prices less than the NAVs of their portfolios (Zweig, 1973; DeLong, Shleifer, Summers and

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Waldman, 1990; Lee, Shleifer and Thaler, 1991). The existence of this discount is quite surprising and it is known as the closed-end fund puzzle in the finance literature.

Although the closed-end fund puzzle is well documented in the developed markets,[1] there are not many studies that examine the relationship between the price and the NAV of the closed-end funds in emerging markets. This study is one of the first papers that examine the closed-end fund puzzle in an emerging market, namely the Istanbul Stock Exchange (ISE).[2] Since emerging markets have different characteristics than developed markets, by analyzing the closed-end fund puzzle and the validity of investor sentiment hypothesis as an explanation for this puzzle in an emerging market, this paper adds to the current literature by filling a gap and showing that the close-end puzzle is a universal phenomenon. In this study, first, the existence of premium or discount on the closed-end funds traded on the Turkish stock exchange is examined. Second, the validity of the investor sentiment hypothesis as an explanation for the discount on closed-end funds is tested in this emerging market.

As far as we know, there is only one other study that examines the relationship between closed-end fund discounts and stock returns in the Turkish market. Candaş and Kandır (2006) test whether the change in the value weighted average discount on closed-end funds affects returns on the Turkish stock market indices for the period between February 1997 and July 2005. Since in our study, we analyze the returns on portfolios of individual securities instead of stock market indices, findings of our paper still make a significant contribution to the literature on the closed-end fund puzzle.

There are several reasons for studying the closed-end fund puzzle in an emerging market. First, emerging markets have been attracting the attention of international investors. Levine and Zervos (1996) indicate that portfolio equity flows to emerging markets increased from $150 million in 1984 to over $39 billion in 1995. Therefore, studies examining the investor behavior in emerging markets have important implications for international investors. Second, even though there are some studies showing that emerging markets are becoming more like world capital markets (Korajczyk, 1996), there are some others documenting that the behavior of returns in these markets differs sharply from that of returns in developed equity markets (Bekaert,

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[1] For example, between 1975 and 1980, closed-end funds in the United States markets sold, on average, at a discount between 15 to 20 percent from their NAVs. From 1983 to 1989, domestic closed-end funds, excluding country funds, had an average discount of less than 5 percent (DeLong and Shleifer, 1992).

[2] We are aware of only three studies analyzing mutual funds in emerging markets. Both Hardouvelis and Tsiritakis (1996) and Halkos and Krintas (2006) find that Greek closed-end funds trade at a discount. In addition, Kytonen, Martikainen and Yli-Olli (1994) study the performance of Finnish mutual funds but they do not examine the closed-end fund puzzle in this market.

Erb, Harvey and Viskanta, 1998; Harvey, 1995). These findings do not help one to determine whether the closed-end fund puzzle is valid and what the role of investor sentiment is in the return generating processes in emerging markets. Third, there are several studies that examine the behavior of emerging market country funds trading in developed markets and find that these funds are also affected from changes in domestic fund premiums (Bodurtha, Kim and Lee, 1995). Therefore, analysis of closed-end funds in emerging markets might help investors to understand the behavior of closed-end country funds as well. Hence, the validity of investor sentiment hypothesis for closed-end funds trading at a discount in an emerging market is an interesting issue that has to be examined empirically.

The ISE has some characteristics that are similar to those of other emerging markets, but different from the characteristics of developed markets. Most of the individuals make short-term investments in the ISE (Yüce, Önder and Mugan, 1999). The empirical studies indicate that the market is not semi-strong form efficient and the evidence about the weak-form efficiency of the ISE is inconclusive (Aydoğan and Muradoğlu, 1998; and Muradoğlu and Ünal, 1994). Moreover, the ISE is a newly established market. It has been operating since 1986. Therefore, investment in stocks is a relatively new alternative for Turkish investors compared to investment in gold or time deposits. In a market like this, understanding investor behavior, i.e. investor sentiment, and how it affects the stock returns could be quite important for international investors. Since many of the characteristics of the ISE listed above are common to other emerging markets, findings of this paper might apply to those markets as well. Hence, the results of this study will provide some information about the pricing of closed-end funds and the effect of investor sentiment on stock returns in emerging markets, and how these markets differ from developed markets in this respect.

In this paper, Turkish closed-end funds are found to trade at a discount in the ISE as well and the size of the discount on these funds is much larger than the discounts observed in developed markets. In light of this finding, three implications of the investor sentiment hypothesis, an explanation for discounts observed on closed-end funds in developed markets (Zweig, 1973; Lee, Shleifer and Thaler, 1991), are tested for the Turkish closed-end funds for a period from July 1995 to June 2007. Overall, findings in this paper provide partial support for the investor sentiment hypothesis as an explanation for the closed-end fund puzzle in the ISE. Contrary to the findings for mature markets, the largest ten percent of stocks listed on the ISE are affected the least from investor sentiment during our overall sample period and they do not seem to be affected significantly at all in the second half of the sample period. This finding suggests that investors should consider investing in the largest capitalization stocks if they do not want to worry about the sentiment of local investors in the ISE.

The remaining sections of this paper are organized as follows. The next section presents the current literature on closed-end funds and discusses the explanations offered for the existence of discounts in these funds. The characteristics of the closed-end funds traded on the ISE are presented in the third section. The fourth section explains the characteristics of the data and the methodology used in the analyses. The empirical findings are presented in the fifth section. The last section summarizes the findings and concludes the paper.

2. Literature review

The shares of closed-end funds generally sell at a price lower than the NAV of their underlying portfolio in the U.S. markets. Since these funds invest in publicly traded securities, like stocks and bonds, it is surprising to observe this discount in the informationally efficient U.S. markets. The fact that the closed-end funds sell at a discount from their NAV is named as the closed-end fund puzzle. Lee, Shleifer and Thaler (1991) identify four components of this puzzle that are well documented for the U.S. closed-end funds. First, closed-end funds start out at a premium of almost 10 percent when organizers raise money from new investors and use it to purchase securities. Second, although they start at a premium,[3] they move to an average discount of over 10 percent within 120 days after their initial offering (Weiss, 1989). Third, discounts on closed-end funds are subject to wide fluctuations over time and across funds. Lastly, when closed-end funds are terminated through either liquidation or an open ending, their share prices rise and discounts shrink (Brauer, 1984; Brickley and Schallheim, 1985).

Several explanations are offered for the existence of this discount. First, the agency cost explanation states that the cost of forming and maintaining the fund is high and this cost causes the closed-end funds to trade at a price less than the NAV of their portfolio. This explanation is dismissed since management fees are small relative to the size of discounts and they do not fluctuate enough to explain the discounts (Lee, Shleifer and Thaler, 1991). Furthermore, agency cost argument cannot explain the existence of premiums for these funds from time to time. Moreover, if NAV represents expected returns on the present portfolio, discounts might reflect the management's differential ability to perform this task. However, Lee, Shleifer and Thaler (1991) show that future NAV performance is weakly related to the present discounts. Furthermore, contrary to expectations, they

[3] Weiss (1989) finds that 20 days after initial offering, the average premium on U.S. stock funds is almost 5 percent.

find that the funds with larger discounts tend to outperform those with smaller discounts.

The second explanation offered for the discount emphasizes the differences in the liquidity of different securities held in the portfolio of closed-end funds. If some of the assets included in the portfolio of closed-end funds are not liquid, prices of these assets used in calculating the NAV may not reflect their true market values. However, in order for this explanation to have any merit, all the closed-end funds should invest in highly illiquid assets in order for the average discount on closed-end funds to be different from zero. Furthermore, the illiquidity argument cannot explain why closed-end funds trade at premiums from time to time. Though the liquidity argument may explain the cross-sectional differences in discounts for close-end funds, since it cannot explain the average discounts/premiums, it is rejected for the U.S. markets. Turkish closed end funds mostly invest in stocks and government bonds. Since these securities have quite liquid secondary markets, this explanation can also be disregarded for the Turkish closed end fund discounts as well.

The last and most frequently tested explanation for the discounts on closed-end funds is the investor sentiment (Zweig, 1973; and DeLong, Shleifer, Summers and Waldmann, 1990). According to the investor sentiment hypothesis, there are two types of investors: rational investors and irrational noise traders. The rational investors are risk averse and have unbiased expectations. On the other hand, noise traders transact based on irrational factors, like sentiment. The sentiment of noise traders changes over time: sometimes these traders are extremely optimistic, other times they are extremely pessimistic. Hence, the variability of noise traders' sentiment creates a new source of risk for rational investors in addition to market risk. In this model, it is assumed that noise traders are small individual investors, and, therefore, they are more likely to trade in closed-end funds than in the underlying securities included in the fund's portfolio. As a result, prices of closed-end funds will be affected from the investor sentiment more than the prices of the underlying securities. Therefore, rational investors will buy closed-end funds only if they are compensated for this new source of risk that affects closed-end funds more. To provide this compensation to the rational investors, the closed-end funds should sell at a discount. Hence, changes in the discount can be explained by changes in the sentiment of investors investing more in closed-end funds relative to underlying assets in the portfolio of funds. Lee, Shleifer and Thaler (1991) show that fluctuations in closed-end fund discounts are explained by changes in sentiments of individual investors. In support of this argument, Siegel (1992) reports that shifts in investor sentiment between optimistic and pessimistic forecasting are correlated with market returns around the crash in October 1987. Furthermore, Swaminathan (1996) shows that discounts

on closed-end funds forecast future excess returns on small firms.[4] In a more recent study, Simpson and Ramchander (2002) report that divergence of consumer sentiment is useful to explain the time variation of discounts and premiums on the First Australian Fund, using Australian and the U.S. consumer survey data.

The investor sentiment hypothesis has three implications. First, levels of and changes in discounts should be highly correlated across closed-end funds since all of these funds will be affected from the investor sentiment. Second, the model states that new funds start when investors are optimistic about the future, i.e. when old funds are trading at a premium. Third, the model requires that the risk created by changes in noise trader sentiment must be systematic. That is, investor sentiment should also affect other assets that are not related with closed-end funds but that are mainly invested in by irrational noise traders. All of these predictions are supported for the U.S. closed-end funds in the study by Lee, Shleifer and Thaler (1991) but they are not tested for closed-end funds in any emerging markets.

These three implications of the investor sentiment hypothesis are tested for the Turkish closed-end funds in this paper. Since investment in stocks is a new alternative in Turkey, principles of modern portfolio management are not utilized well by individual Turkish investors (Yüce, Önder and Mugan, 1999). Therefore, small investors could be willing to pay a higher price to buy the portfolios formed by professional portfolio managers who use modern portfolio management techniques. Hence, zero or positive premium, instead of a discount, can be expected for the closed-end funds traded on the ISE. Furthermore, fund managers may not be all that experienced in understanding the investor sentiment. As a result, some of the implications of the investor sentiment hypothesis may not be validated in Turkey, even though it is the right explanation for discounts. Therefore, the validity of investor sentiment hypothesis as an explanation for deviations of stock prices of Turkish closed-end funds from their NAVs has to be examined empirically.

3. Characteristics of the stock exchange and mutual funds in Turkey

The ISE has been established in 1986 and since then, it has been developing. The ISE was ranked as the thirty-second (seventeenth) in terms of domestic market capitalization, and the tenth (fifth) in terms of turnover velocity[5] of domestic shares among 51 (34) exchanges (emerging markets)

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[4] However, Elton, Gruber and Busse (1998) find that small investor sentiment is not a significant factor in the return generating process.

[5] Turnover velocity of domestic shares is defined as the ratio between the turnover of domestic shares and their market capitalization.

in 2006 according to the World Federation of Exchanges.[6] The high turnover rate is not surprising given the evidence in Yüce, Önder and Mugan (1999). According to this study, the average holding period for individual investors in Turkey is around 45 days.

The ISE does not have any restriction on foreign portfolio holdings and allows for free repatriation of proceeds from investments in Turkish stocks. Therefore, the involvement of foreign investors has increased dramatically over time. As shown in Table 1, there was no foreign investment in the ISE in 1988, but it reached its highest level of 70,262 million U.S. dollars in 2007. This increase in international investment in the ISE is not unique. Over the past several years, involvement of international investors in emerging markets has increased tremendously (Levine and Zervos, 1996). However, after the Russian crisis and economic crises in Turkey, a decline in foreign involvement was observed. In 2006, foreign investment in the ISE corresponded to 70.6 percent of total market capitalization.[7]

The first closed-end fund started trading on the ISE in 1991. As of June 2007, there were 33 closed-end funds trading on the ISE and they constituted almost 0.13 percent of total market capitalization.[8] Out of these thirty-three funds, thirty of them are classified as equity funds which are required to invest at least 25 percent of their portfolios in stocks. Twenty-four of the equity closed-end funds were established during the period analyzed in this paper. Since 1991, none of the closed-end funds has been liquidated except for the Global Fund, which was converted into a real estate investment trust. So, there are a total of 31 closed-end equity funds in our sample.

In order to establish a closed-end fund, a corporation has to obtain a permit from the Capital Markets Board of Turkey (CMB). Within fifteen days after the initial public offering, the stocks of the closed-end funds start trading on the ISE. The CMB has required closed-end funds to report their portfolio holdings every Friday to the ISE since July 1995 and these reports are published in the ISE Weekly Bulletins.

The portfolio of closed-end funds can consist of investments in stocks, Treasury bills and government bonds, as well as foreign exchange and valuable commodities, such as gold. The closed-end funds in our sample mainly hold stocks, Treasury bills and repurchase agreements. On average,

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[6] Source: www.world-exchanges.org.

[7] Source: Merkezi Kayıt Sistemi, Aylık Bülten, Haziran 2007, http://www.mkk.com.tr/MkkComTr/assets/files/tr/piyasa/istatistik/IAYP200706.xls

[8] Closed end mutual funds constitute a small portion of the stock market in Turkey. When we consider mutual funds, including closed-end funds, open-end funds and pension funds, their portfolio value constitutes 10.5% of total market capitalization in June 2007. On the other hand, in the U.S., mutual funds held 12.2 percent of total value of outstanding stocks in 1994 (Edwards, 1996).

stocks constitute approximately 56 percent of the portfolio holdings of closed-end funds during the sample period analyzed in this paper.

Several restrictions on the portfolio holdings of closed-end funds are imposed by the CMB. For example, the closed-end funds are not allowed to hold more than 9 percent of the shares of any company. Furthermore, they cannot invest more than 10 percent of their NAV in the securities of a single company. If this limit is exceeded because of changes in the NAV of the closed-end fund, the portfolio holdings of the fund should be adjusted within three months to satisfy the requirements of the Capital Markets Board. The closed-end funds are allowed to participate in Initial Public Offerings. However, they cannot invest in domestic or foreign closed-end or open-end funds.

4. Methodology and data sources

4.1. Methodology

Turkish closed-end fund prices relative to their NAVs are examined for the period between July 1995 and June 2007. The discount for a fund *i* in a given week *t*, $DISC_{it}$, is calculated using the following equation:

$$DISC_{it} = \left[\frac{NAV_{it} - SP_{it}}{NAV_{it}} \right] \text{x } 100 \qquad (1)$$

In this equation, NAV_{it} is the net asset value of fund *i* at the end of week *t*. SP_{it} represents the stock price of a mutual fund *i* at the end of the week *t*. Based on these discounts on individual funds, a value-weighted index of discounts on a weekly basis is constructed using the following formula:

$$VWD_t = \sum_{t=1}^{n_t} W_{it} DISC_{it} \qquad (2)$$

The weight of fund *i* for week *t*, W_{it}, is

$$W_{it} = \frac{NAV_{it}}{\sum_{t=1}^{n_t} NAV_{it}} \qquad (3)$$

where n_t is the number of funds with available $DISC_{it}$ and NAV_{it} data at the end of week *t*. The change in the value-weighted index of average discounts on two consecutive trading weeks (ΔVWD_t), the key variable in the analyses of this paper, is computed using the following formula:

$$\Delta VWD_t = VWD_t - VWD_{t-1} \qquad (4)$$

In the calculation of ΔVWD, it is required that both $DISC_{it}$ and NAV_{it} for fund i are available in periods t and $t-1$.

In order to test the last implication of the investor sentiment hypothesis, ten equally weighted size portfolios are formed based on the market capitalization of stocks traded on the ISE-National Market.[9] To be included in a portfolio, a stock should be trading on the ISE-National Market at the beginning of a portfolio formation period. Stocks are assigned to a portfolio based on their market capitalization at the beginning of July of each year during our sample period.[10] These portfolios are held until the end of June of the next year. As a result, there are a total of twelve portfolio formation periods during our sample period. The first portfolio consists of the smallest capitalization decile of all stocks traded on the ISE-National Market and the tenth portfolio consists of the largest capitalization decile of all stocks traded on the ISE-National Market. Equally weighted portfolios of these stocks are created. In addition to the 10 size sorted portfolios, an equally weighted portfolio of all stocks traded on the ISE is also formed. Continuously compounded weekly returns for these ten size-sorted portfolios and for the overall portfolio (portfolio of all the stocks listed on the ISE-National Market) are calculated using weekly returns on individual stocks. The continuously compounded weekly return on the ISE-100 composite index is used as a proxy for the market return.[11] The change in the value-weighted discount on Turkish closed-end funds is added to the market model as another factor to measure the effect of change in investor sentiment on portfolio returns.

4.2. Data sources

The data used in the analyses are obtained from two sources. NAVs of closed-end funds on Fridays, and the number of shares outstanding for all the companies listed on the ISE at the time of their initial public offering are collected from the weekly bulletins of the ISE. The closing prices of closed-

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[9] There are four markets in the ISE: National Market, Regional Market, Market for New Issues and Watch Market. Because of the differences in microstructures and characteristics of stocks trading in these markets, the sample for the construction of portfolios is constrained to the stocks listed on the ISE-National Market.

[10] Each portfolio formation period starts on July. For example, our first period is from July 1995 to June 1996 and stocks that are traded on the National Market are assigned to a portfolio based on their market capitalization on the first trading day of July 1995. If any stock that is delisted or moved to the other segments of the ISE at any point in time, it is removed from the portfolio.

[11] To check for the robusteness of our findings, we repeated our analysis using the returns on ISE-All index rather than the returns on ISE-100 index as our market portfolios. Furthermore, we repeated the analysis using market value weighted portfolios of securities instead of equally weighted portfolios. Finally, we reestimated the models with 3 lags of market portfolio to account for non-synchronous trading. The results from each of these robustness checks are qualitatively the same as those reported in Table 5, therefore, they are not reported in the paper to conserve space.

end funds, the level of ISE-100 composite index and closing prices of all the stocks listed on the ISE on Fridays are obtained from the ISE Databases. Closing prices are adjusted for stock splits and dividends by the authors. Similarly, the number of shares outstanding for each stock and closed-end fund is adjusted for stock splits.[12] Market values of stocks at any point in time are calculated by using adjusted closing prices and number of shares outstanding on that day.

5. Empirical findings

This section presents the results of empirical analyses for Turkish closed-end funds. First, the relationship between closed-end fund prices and the NAVs is reported. Second, tests of the three implications of the investor sentiment hypothesis for the Turkish closed-end funds are presented.

5.1. Relationship between closing prices and NAVs of Turkish closed-end funds

Table 2 presents the descriptive statistics of the weekly discounts for the thirty one closed-end equity funds traded on the ISE over the period between July 1995 and June 2007. The number of observations changes depending on the initial public offering date of the closed-end fund. The results show that the Turkish closed-end funds are, on average, sell at a discount as well. The average value-weighted discount is 25.23 percent, which is larger than the discount reported for the U.S. closed-end funds (Weiss, 1989; Lee, Shleifer and Thaler, 1991). However, there are large fluctuations across funds in terms of average discounts. The average discount on individual funds during the sample period ranges from a premium of 102.37 percent (for Avrasya Fund) to a discount of 40.86 percent (for Atlantis Fund). Twelve of the thirty-one closed-end funds (Avrasya Fund, Ata Fund, Deniz Fund, Euro Fund, Garanti Fund, Gedik Fund, Hedef Fund, Info Fund, Metro Fund, Mustafa Yilmaz Fund, Taksim Fund and Yatirim Finansman Fund), on average, trade at a premium over the period analyzed. Interestingly, five of the funds trading at a premium on average were started to be traded on the ISE after 2004. There are a total of 9 funds that started trading during that time period. Therefore, a little over 50% of those funds started after 2004 trade at a premium on average during our sample period.

[12] Keeping the price within a reasonable price range is a common explanation given for stock splits. Because of high annual inflation rate in Turkey, it is hard to keep stock prices within that range without having frequent splits.

Table 2
Closed-End Fund Discounts: July 1995 - June 2007

Closed-end Mutual Funds	Mean (%)	Std. Dev. (%)	Minimum (%)	Maximum (%)	Number of Weeks in the Sample
Ak	30.14	24.04	-96.31	66.22	421
Alternatif	14.16	49.44	-249.16	66.12	561
Atlas	32.86	21.36	-95.25	71.84	619
Atlantis	40.86	16.77	-34.09	67.07	620
Avrasya	-102.37	225.02	-1450	51.18	567
Ata	-9.04	43.58	-246.15	54.27	503
Baskent	19.25	8.65	-5.32	35.16	54
Bumerang	20.57	44.73	-311.88	69.51	620
Deniz	-33.62	127.39	-1251.00	58.20	604
Eczacibasi	11.44	34.90	-109.00	64.60	438
Euro	-25.83	40.13	-158.25	14.04	53
Evg	18.13	13.05	-12.75	38.02	102
Evren	28.34	34.23	-218.88	71.65	619
Finans	40.07	16.08	-25.69	80.84	580
Garanti	-24.04	98.62	-344.52	63.94	550
Gedik	-10.20	45.46	-408.29	62.12	426
Global	22.62	27.26	-102.73	65.95	579
Hedef	-5.92	7.87	-30.64	7.42	90
Info	-5.72	26.88	-72.19	35.42	173
Is	16.28	32.37	-133.05	60.04	581
Metro	-9.00	18.25	-85.06	18.68	57
Mustafa Yilmaz	-1.49	107.55	-1085.00	68.83	620
Oyak	10.97	6.18	0.93	20.18	9
Tac	9.17	25.79	-167.06	54.24	529
Tacirler	10.28	9.76	-16.48	24.75	51
Taksim	-0.84	20.06	-73.86	24.42	57
TSKB	9.24	43.34	-191.96	57.26	295
Vakif	6.64	39.85	-173.65	71.20	620
Varlik	10.24	65.45	-938.46	62.25	467
Yapi Kredi	36.59	17.56	-58.49	83.56	605
Yatirim Finansman	-7.64	39.65	-222.50	43.61	401
WVD	25.23	20.13	-44.23	57.52	620
Bank related VWD	21.84	24.16	-72.22	64.38	620
Non-Bank related VWD	7.43	8.36	-13.00	31.52	620
Return on ISE Index	0.74	6.22	-30.37	25.78	621

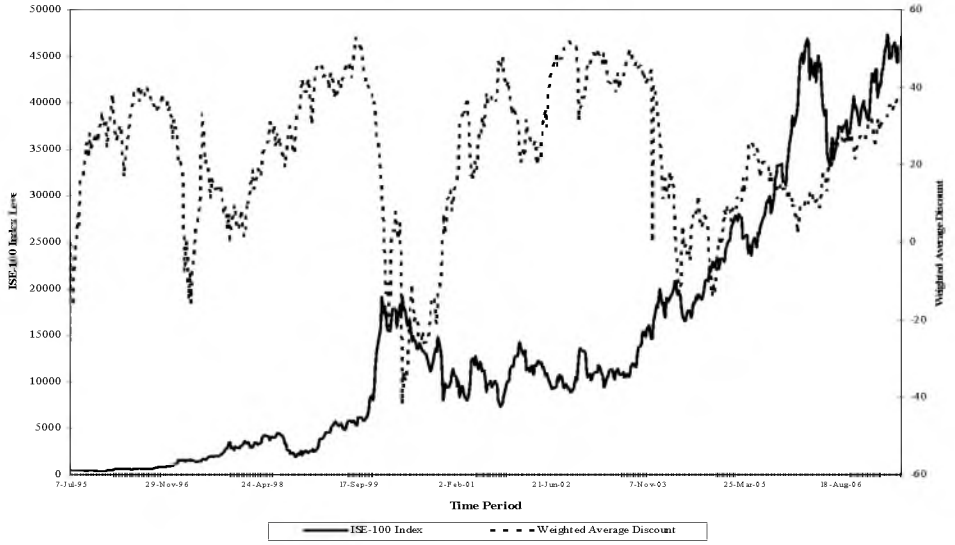
The percentage discount on 31 individual Turkish closed-end funds are calculated by dividing the difference between net asset value and stock price of a fund by the net asset value of that fund on a weekly basis. VWD represents value weighted percentage discount on all funds. ISE Index corresponds to the weekly return on the ISE-100 Composite Index.

Figure 1 shows how the level of ISE-100 Composite Index and the value-weighted discount (VWD) change over the sample period. VWD

declines sharply during the market boom at the end of 1999 and the beginning of 2004. Although VWD fluctuates when the market declines in the middle of year 2000, the graph suggests that there is a negative relationship between the level of the ISE-100 Composite index and VWD during the economic crisis period starting in November 2000. Like the discounts in developed markets, the average discount on Turkish closed-end funds fluctuates quite a lot from week to week.

Figure 1

The Level of ISE-100 Index and the Value Weighted Discount, Period: July 1995-June 2007



This figure shows the weekly value weighted percentage discount on the portfolio of all Turkish closed-end funds (the dotted line) and the level of ISE-100 Composite index (the solid line) for the period between July 1995 and June 2007.

5.2. Tests of implications of the investor sentiment hypothesis

Three implications of the investor sentiment hypothesis are tested in this section. The first implication states that the discounts on closed-end funds are correlated. The second implication predicts that new closed-end funds are started when the existing funds are selling at premiums, or at small discounts. The third implication states that the changes in discounts should be correlated with the returns of other stocks that are not related with these funds. Empirical findings regarding each of these implications are presented in the following subsections.

5.2.1. Pairwise correlations between discounts on Turkish closed-end funds

It is found that there is a high correlation between discounts on closed-end funds. The pairwise Pearson correlation coefficients for the weekly

discounts on each fund are reported in Table 3. Most of the discounts on individual closed-end funds are significantly positively correlated supporting the investor sentiment hypothesis. Furthermore, all of the discounts on individual closed-end funds are positively significantly correlated with the *VWD*.

The correlation between the average discount and the return on the ISE index is positive but it is not statistically significant. On the other hand, the correlations between individual fund discounts and the return on the ISE index are statistically significant for four funds at the 10 percent significance level. This positive correlation may be explained by the stock holdings of these funds.

Overall, the results reported in this section show that discounts on Turkish closed-end funds are highly correlated. Out of 465 pairwise correlations between the discounts on individual funds, 318 (68.39%) are positive and significant at least at the 10 percent level and 43 (9.25%) are negative and significant at least at the 10 percent level. Remaining coefficients are insignificant. Interestingly, fourteen of the significant and negative correlations are between other funds and Avrasya Fund which was selling at a very high premium on average during our sample period. These findings provide strong evidence in support of the first implication of the investor sentiment hypothesis which states that discounts on closed-end funds are positively correlated.

5.2.2. When did new funds start?

In this subsection, the average discount on the existing closed-end funds around the introduction of a new fund is analyzed. Results are shown in Table 4. None of the 24 funds started during our sample period had their Initial Public Offerings (IPOs) when existing closed-end funds were trading at a premium. However, nine funds (Ata, Baskent, Deniz, Euro, Hedef, Info, Metro, Taksim and Yapi Kredi Fund) had their IPOs when the average discount on existing funds is less than the average discount during our sample period. Interestingly, six of those nine funds started trading on the ISE after 2004. With the exception of one fund, namely the Tac Fund, new funds had their first trading day on the ISE when the existing closed-end funds were trading on average at a discount. Only the Tac Fund started trading on the ISE when existing funds were trading on average at a premium of 9.46 percent. Two funds, Ata Fund and Info Fund, started when the existing closed-end funds were trading on average at a small discount of 8.46 percent and 5.97 percent, respectively. Furthermore, six more funds (Deniz, Finans, Hedef, Metro, Taksim and Yapi Kredi Fund) started trading when average discount on existing closed-end funds was less than the average discount of 25.23 percent observed during the sample period.

Nine of the twenty-four funds (Euro, EVG, Hedef, Info, Is, Metro, Tac, Tacirler and Taksim Fund) that started during the sample period traded at a premium on average over the four weeks following their first trading day on the ISE. Of these nine funds, seven of them started trading on the ISE after 2004. Twelve more funds traded at a discount lower than the average discount observed during our sample period for all funds. Only three funds traded at a discount higher than the average discount during our sample period. One explanation regarding the introduction of new funds when existing funds were trading at a discount may be the lack of experience on the part of fund managers regarding when to start a new closed-end fund. This explanation relies on the assumption that closed-end fund discounts/premiums is a good measure of investors sentiment. Furthermore, premiums on Turkish closed-end funds were quite rare. During the sample period of 620 weeks, there were only 71 weeks in which closed-end funds were trading at a premium on average. These 71 weeks were clustered in six periods: July 14 – July 28, 1995, February 28 – April 17, 1997, January 28 – March 3, 2000, April 21 – November 24, 2000, March 26 – June 11, 2004, and September 24 – November 16, 2004. With the exception of Tac Fund and Info Fund, none of the funds started to trade in these premium periods.

Investor sentiment hypothesis predicts that new funds start when existing funds are trading at a premium. Furthermore, they first start trading, new funds also trade at a premium early on. Therefore, results reported in this section provide some support for the investor sentiment hypothesis, especially during the later part of our sample period.

The movement in the market can also be considered as an indication of optimism in the market. In that case, new funds should start when the market is in an upward trend. As observed in Table 4, all of the funds except for Alternatif, Baskent, Euro, Metro, Tac, Tacirler, Taksim, TSKB, and Varlik Funds, had their IPOs when the average return on the market was positive over the four-week period before their IPO date. Furthermore, all of the funds except for Alternatif, Baskent, Euro, Finans, Metro, and Taksim Funds, had their first trading day on the ISE when the average return on the market was positive over the four-week period following their first trading day. Even though these results are consistent with new funds starting when the market participants are optimistic, they provide just circumstantial evidence. Therefore, we do not want to emphasize them too much.

These results suggest that there might be other reasons for the initial offering of closed-end funds in Turkey. Most of the closed-end funds are owned by banks and other financial intermediaries. Alternatively, the management of parent company might require the formation of a mutual fund in order to provide liquidity to the market or to trade in some stocks for speculative purposes. It might take a long time to get permission from the

Capital Markets Board, hence, taking the application date of the closed-end fund to the Capital Markets Board as the starting date of that fund might be a better indicator of the optimistic investor sentiment around new fund starts compared to taking the initial public offering date. It took an average of three months to get an approval from the Capital Markets Board for closed-end funds in our sample and four months from the first application to the first trading day of the funds in the ISE.[13] Although none of these funds applied to the Capital Markets Board during the premium periods, in general, the average return on the ISE-100 index was positive over the four-week period before the application.

5.2.3. Discounts on closed-end funds and returns on size-decile portfolios

According to the investor sentiment hypothesis, changes in investor sentiment will affect smaller capitalization stocks more than the other stocks since individual investors are more likely to hold the former group of stocks. In order to test this implication of the investor sentiment hypothesis, a two-factor model is used to explain the returns on ten size-sorted portfolios. In other words, ΔVWD is added to the market model as the second factor.

Table 5 presents the regression results for testing the third implication of the investor sentiment hypothesis with the two-factor model. In these regressions, the coefficient of the ISE-100 Composite Index is positive and statistically significant for all size portfolios and for the overall portfolio as well. These coefficients increase monotonically as the size of portfolio increases.[14] This can be explained by the higher representation of the larger capitalization stocks in the ISE-100 Composite index.

The coefficient of the change in value-weighted discount on Turkish closed-end funds is found to be negative and statistically significant for all size portfolios. Furthermore, changes in value-weighted discount have a statistically significant negative coefficient in the regression for the return on the portfolio of all the stocks listed on the ISE. These negative coefficients indicate that when discount declines, stocks do well. Hence, if investors are optimistic about closed-end funds, the discount declines and the stocks perform well. However, if investors are pessimistic about closed-end funds, discount increases and stocks perform badly.

Although the decline in the coefficient on change in VWD is not monotonic as size increases, the highest impact of the change in discount is

[13] Tac fund is clearly an exception. Interestingly, this fund was offered to the public during December 5-6, 1995 but it started to be traded in the ISE on April 11, 1997.

[14] Market model regressions are also estimated to see the sensitivity of beta coefficients to the inclusion of changes in value-weighted discounts on closed-end funds as the second factor. Results indicate that beta coefficients are not sensitive to the addition of this variable to the market model.

Table 5

The Time-Series Relationships between Returns on Size Decile Portfolios, the Market Return and the Changes in Closed-End Fund Discounts

Decile Number	Average Weekly Return on the Portfolio	Intercept	Return on the ISE Index	Change in VWD	Adjusted R-squared
1	0.804	0.352	0.653	-0.199	0.6397
		(2.37)	(18.34)	(-5.31)	
2	0.578	0.093	0.697	-0.193	0.6913
		(0.68)	(22.34)	(-5.59)	
3	0.583	0.064	0.740	-0.166	0.705
		(0.47)	(20.91)	(-4.28)	
4	0.497	-0.018	0.740	-0.203	0.7145
		(-0.13)	(22.51)	(-5.79)	
5	0.595	0.070	0.748	-0.162	0.7595
		(0.59)	(27.24)	(-4.61)	
6	0.617	0.058	0.796	-0.172	0.7694
		(0.50)	(25.04)	(-5.23)	
7	0.485	-0.090	0.817	-0.157	0.8106
		(-0.82)	(33.80)	(-5.81)	
8	0.506	-0.093	0.844	-0.109	0.8246
		(-0.93)	(32.19)	(-4.42)	
9	0.460	-0.181	0.903	-0.117	0.8778
		(-2.00)	(50.72)	(-5.24)	
10	0.518	-0.139	0.917	-0.060	0.9082
		(-1.81)	(47.26)	(-2.87)	
	0.440				
All	0.564	0.012	0.786	-0.154	0.564
		(0.29)	(81.51)	(-14.91)	

The time-series relationship between weekly returns on decile portfolios (dependent variables), and changes in the weekly value weighted percentage discounts of all existing closed-end funds and the return on the ISE-100 Index (independent variables) is examined using the regression analysis. Decile 1 and Decile 10 include the smallest and the largest stocks respectively. Stocks are assigned to deciles based on their market value on the first trading day of July in each year over the sample period. The dependent variable on the last row is the average return on a portfolio containing all of the stocks trading on the National market of the ISE. Because of heteroscedasticity, the models are estimated with the general method of moments. Heteroscedasticity adjusted standard errors are used in calculating t-statistics reported in parentheses.

observed on the fourth decile portfolio and the lowest impact is found on the largest size portfolio. According to the regression results, a one percent decline in the weekly value-weighted discount is associated with an increase in return of the first (last) decile portfolio of 0.199 (0.060) percent in that week. Since the mean change in the weekly discount index is 0.098 percent in the sample period, the discount factor is associated with weekly fluctuation of 1.98 (0.59) percent in the first (last) decile portfolio returns. Furthermore, the mean weekly return for the stocks in the first (last) decile portfolio over the sample period is 0.811 percent (0.526 percent). Thus, in a typical week, approximately 2.46 percent (1.14 percent) of the weekly returns of the first (last) decile portfolio is explained by the changes in the value weighted discount. Hence, the impact of investor sentiment is higher for the smallest size stocks.

To analyze the robustness of these regression results, our sample is divided into two equal time intervals and the regressions are reestimated for these time intervals individually. The first subsample covers a period from July 1995 to June 2001 and the second subsample covers a period from July 2001 to June 2007. The regression results for these two subsamples are reported in Panels A and B of Table 6. These results are essentially the same as those for the overall sample. However, there are some interesting observations that can be made from this analysis. First of all, the impact of changes in the discount on security returns is much higher in the first half of the sample period relative to the second half as indicated by higher coefficient estimates and higher t-statistics for these estimates. In addition to the overall decrease in the impact of changes in discount on security returns in the second half of the sample period, the largest size portfolio has a statistically insignificant coefficient on this variable. This indicates that largest size stocks are immune to changes in investor sentiment in the second half of the sample.

Compared to the U.S. stocks, the change in discount has a smaller impact on all size portfolios of Turkish stocks. Nevertheless, results in this section suggest that the investor sentiment affects the return generating process of common stocks in Turkey. Furthermore, largest stocks seem to be marginally affected or not affected at all from changes in investor sentiment. Hence, these stocks could be safer bets for international investors who do not want to worry about the sentiment of local investors. These findings suggest that understanding the investor sentiment in emerging markets is as important as it is in the developed markets.

Table 6

Subsample Analysis of the Time-Series Relationships between Returns on Size Decile Portfolios, the Market Return and the Changes in Closed-End Fund Discounts.

Panel A: Period from July 1995 to June 2001

Decile Number	Average Weekly Return on the Portfolio	Intercept	Return on the ISE Index	Change in VWD	Adjusted R-squared
1	1.095	0.421	0.687	-0.226	0.6710
		(1.71)	(15.56)	(-4.47)	
2	0.848	0.152	0.706	-0.210	0.7038
		(0.68)	(18.32)	(-4.16)	
3	0.771	0.018	0.760	-0.184	0.7198
		(0.08)	(17.27)	(-3.33)	
4	0.575	-0.157	0.745	-0.225	0.7181
		(-0.68)	(18.34)	(-4.81)	
5	0.728	-0.026	0.758	-0.166	0.7669
		(-0.14)	(22.61)	(-3.33)	
6	0.781	-0.028	0.814	-0.190	0.7844
		(-0.15)	(20.25)	(-4.07)	
7	0.618	-0.209	0.831	-0.181	0.8324
		(-1.22)	(29.48)	(-5.27)	
8	0.570	-0.298	0.865	-0.128	0.8446
		(-1.86)	(27.16)	(-3.76)	
9	0.581	-0.358	0.935	-0.138	0.8928
		(-2.50)	(42.97)	(-4.29)	
10	0.702	-0.220	0.911	-0.078	0.8873
		(-1.54)	(34.93)	(-2.50)	
All	0.727	-0.071	0.801	-0.172	0.7811
		(-1.10)	(67.56)	(-12.18)	

The time-series relationship between weekly returns on decile portfolios (dependent variables), and changes in the weekly value weighted percentage discounts of all existing closed-end funds and the return on the ISE-100 Index (independent variables) is examined using the regression analysis. Decile 1 and Decile 10 include the smallest and the largest stocks respectively. Stocks are assigned to deciles based on their market value on the first trading day of July in each year over the sample period. The dependent variable on the last row is the average return on a portfolio containing all of the stocks trading on the National market of the ISE. Because of heteroscedasticity, the models are estimated with the general method of moments. Heteroscedasticity adjusted standard errors are used in calculating the t-statistics reported in parentheses.

Table 6 (continued)
Subsample Analysis of the Time-Series Relationships between Returns on Size Decile Portfolios, the Market Return and the Changes in Closed-End Fund Discounts

Panel B: Period from July 2001 to June 2007

Decile Number	Average Weekly Return on the Portfolio	Intercept	Return on the ISE Index	Change in VWD	Adjusted R-squared
1	0.515	0.287	0.564	-0.170	0.5639
		(1.820)	(10.81)	(-3.56)	
2	0.310	0.035	0.674	-0.167	0.6580
		(0.230)	(13.12)	(-3.98)	
3	0.396	0.112	0.692	-0.143	0.6677
		(0.740)	(13.35)	(-3.05)	
4	0.420	0.118	0.735	-0.159	0.7065
		(0.780)	(14.41)	(-3.45)	
5	0.463	0.165	0.727	-0.158	0.7405
		(1.190)	(16.23)	(-4.05)	
6	0.454	0.144	0.753	-0.146	0.7327
		(1.040)	(16.41)	(-3.76)	
7	0.353	0.027	0.787	-0.115	0.7601
		(0.190)	(17.53)	(-2.72)	
8	0.443	0.109	0.799	-0.078	0.7798
		(0.920)	(18.38)	(-2.23)	
9	0.339	-0.005	0.825	-0.093	0.8473
		(-0.050)	(31.35)	(-3.13)	
10	0.336	-0.062	0.940	-0.019	0.9613
		(-1.10)	(61.71)	(-1.31)	
All	0.403	0.093	0.750	-0.125	0.7398
		(2.16)	(51.07)	(-9.66)	

The time-series relationship between weekly returns on decile portfolios (dependent variables), and changes in the weekly value weighted percentage discounts of all existing closed-end funds and the return on the ISE-100 Index (independent variables) is examined using the regression analysis. Decile 1 and Decile 10 include the smallest and the largest stocks respectively. Stocks are assigned to deciles based on their market value on the first trading day of July in each year over the sample period. The dependent variable on the last row is the average return on a portfolio containing all of the stocks trading on the National market of the ISE. Because of heteroscedasticity, the models are estimated with the general method of moments. Heteroscedasticity adjusted standard errors are used in calculating the t-statistics reported in parentheses.

6. Conclusions

This study examines the pricing of closed-end funds in an emerging market, namely the Istanbul Stock Exchange. First, it is shown that closed-end funds in the ISE trade at discounts as well. The size of the discount in the ISE is much larger than that observed for closed-end funds in the U.S. markets. This result is not consistent with findings of Canbaş and Kandır (2006). Using monthly data, they observe a very small average discount (0.14%) for Turkish closed-end funds during their sample period. Since different time periods and data with different frequency are analyzed in the two papers, this inconsistency in their findings may not be all that surprising. Furthermore, the discount on Turkish closed-end funds fluctuates widely over time just like the discount on the U.S. funds does. After documenting the discount and its variability, the validity of the investor sentiment hypothesis as an explanation for this discount is investigated for the funds traded on the ISE.

Three implications of the investor sentiment hypothesis for the discount on closed-end funds traded on the ISE are tested. First, it is found that discounts on Turkish closed-end funds are positively correlated across funds, supporting the investor sentiment hypothesis. Second, twenty-three of the twenty four new funds that started during the sample period were initiated when old funds were trading at a discount. This could be due to luck or this result may indicate that closed-end fund managers are still learning that it is better to start new funds when old funds are trading at a premium. However, nine of these funds trade on average at a premium over the first four weeks of their trading on the ISE. Even though the first result is inconsistent with the implications of the investor sentiment hypothesis, the second one supports this hypothesis. Furthermore, almost all of the funds started when the average return on the market index over the four-week period prior to their first trading was positive. Lastly, the average discount on closed-end funds explains the size-sorted portfolio returns in Turkey. The coefficient of the average discount is negative and statistically significant for the first nine size-sorted portfolios indicating that these stocks do well when investors are optimistic. This result is consistent with the findings of Canbaş and Kandır (2006). They find that the change in the discount on Turkish closed-end funds significantly and negatively affects the returns on not only the ISE-100 index but also the financial, manufacturing and services indices. Moreover, the negative effect of this change in discount on stock returns declines during the second sub-period between May 2001 and July 2005.

These results suggest that the findings in this paper support the investor sentiment hypothesis as an explanation of the discounts on closed-end funds in Turkey. Since closed-end funds trade at a discount in Turkey as well, either the modern portfolio management techniques, supposedly

utilized by fund managers, do not seem to have much value in Turkey or Turkish fund managers do not use these techniques.

The findings of this paper have several implications for international investors in emerging markets as well as for the country fund managers. First, investor sentiment seems to influence stock returns in an emerging market, namely the ISE. Second, in later years, small and medium capitalization stocks are affected from investor sentiment in this market whereas large capitalization stocks are not, unlike the evidence for mature exchanges. Hence, all of these effects have to be considered in making investment decisions in the Turkish market. Since the ISE has many characteristics similar to those of other emerging markets, the findings of this paper might be generalized to other emerging markets as well.

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Özet

Gelişmekte olan bir piyasada yatırımcı hissiyatı ve yatırım ortaklıkları bulmacası

Bu çalışma İstanbul Menkul Kıymetler Borsası'nda yatırım ortaklıkları bulmacasını incelemektedir. Yatırım ortaklıkları gelişmekte olan bu piyasada da iskontolu olarak işlem görmekle birlikte piyasada gözlenen iskonto oranı diğer piyasalara oranla çok daha yüksektir. Çalışmanın bulguları yatırımcı hissiyatı hipotezini kısmi olarak desteklemektedir. Gelişmiş piyasalardaki bulguların aksine, yatırımcı hissiyatının piyasa değerine göre ilk yüzde onda yer alan hisse senetlerinin getirileri üzerinde anlamlı bir etkisi bulunmamaktadır. Yerel yatırımcıların hissiyatından etkilenmek istemeyen yabancı yatırımcılar için bu hisse senetleri güvenli yatırım olabilir.

Anahtar kelimeler: Yatırım ortaklığı bulmacası, yatırımcı hissiyatı.

JEL kodları: G12.

Table 1
The Development of the ISE over Years

Year	Number of shares traded (million)	Trading Volume (million U.S. $)	Market Capitalization (million U.S. $)	% change in the index ($)	Foreign Investment (million U.S. $)	Number of Firms Listed	Number of Closed-End Funds	Value of Closed-End Funds (million U.S. $)
1988	32	115	1,128			79	0	0
1989	238	773	6,756	367.84	17	76	0	0
1990	1,537	5,854	18,737	14.64	89	110	0	0
1991	4,531	8,502	15,564	-21.96	147	134	1	1
1992	10,285	8,567	9,922	-45.64	359	145	2	4
1993	35,249	21,770	37,824	205.67	753	160	2	16
1994	100,062	23,203	21,785	-50.40	1,256	176	3	17
1995	306,254	52,357	20,782	-7.42	1,936	205	9	20
1996	390,924	37,737	30,797	39.57	3,085	228	14	40
1997	919,784	58,104	61,879	83.89	6,018	258	16	78
1998	2,242,531	70,396	33,975	-50.71	3,700	277	17	47
1999	5,823,858	84,034	114,271	241.77	15,358	285	21	122
2000	11,075,685	181,934	69,507	-50.58	7,404	315	21	103
2001	23,938,149	80,400	47,689	-31.80	5,635	310	22	66
2002	33,933,251	70,756	34,402	-33.95	3,450	288	22	45
2003	59,099,780	100,165	69,003	111.38	8,954	285	22	110
2004	6,639,955	147,755	98,073	38.11	16,141	297	23	212
2005	8,338,906	201,763	162,814	60.56	33,835	304	26	368
2006	5,976,128	229,642	163,774	-6.12	39,776	316	31	322
2007	5,398,138	300,842	289,986	72.14	70,262	319	33	370

This table shows the total number of shares traded, total dollar value of traded shares, the total market capitalization, the percentage change in the ISE-100 index reported in US$, the amount of investment in the ISE securities by foreigners, the number of companies listed on the ISE, the number of closed-end funds listed on the ISE, and the market capitalization of closed-end funds year by year. The decline in the number of shares traded in 2004 is because of the change in the lot size with the conversion of currency to the new lira, YTL (1 YTL=1,000,000 TL).

Source: ISE Bulletins.

Table 3
Correlation Coefficients for Weekly Discounts on Closed-End Funds

	Ak	Alternatif	Atlas	Atlantis	Avrasya	Ata	Baskent	Bumerang	Deniz
Alternatif	0.695								
	(0.00)								
Atlas	0.309	0.427							
	(0.00)	(0.00)							
Atlantis	0.249	0.505	0.698						
	(0.00)	(0.00)	(0.00)						
Avrasya	0.090	-0.111	-0.081	-0.192					
	(0.07)	(0.01)	(0.05)	(0.00)					
Ata	0.246	0.407	0.658	0.607	-0.319				
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)				
Baskent	0.695	0.442	0.704	0.488	0.646	0.562			
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)			
Bumerang	0.125	0.386	0.390	0.648	-0.060	0.358	-0.088		
	(0.01)	(0.00)	(0.00)	(0.00)	(0.15)	(0.00)	(0.53)		
Deniz	0.129	0.259	0.142	0.509	-0.172	0.213	0.490	0.751	
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	
Eczacibasi	0.664	0.446	0.185	-0.011	0.248	-0.021	0.535	0.056	-0.003
	(0.00)	(0.00)	(0.00)	(0.82)	(0.00)	(0.66)	(0.00)	(0.24)	(0.95)
Euro	0.593	0.818	0.309	0.820	0.485	0.226	0.461	0.251	0.559
	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.10)	(0.00)	(0.07)	(0.00)
Evg	0.512	0.690	0.545	0.722	0.842	0.444	-0.208	0.491	0.817
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.13)	(0.00)	(0.00)
Evren	0.098	0.120	0.560	0.326	-0.120	0.470	0.606	0.155	-0.068
	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.10)
Finans	0.408	0.474	0.699	0.679	-0.279	0.640	0.399	0.362	0.160
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Gedik	0.133	0.265	0.259	0.545	-0.141	0.326	0.507	0.784	0.802
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Global	0.226	0.130	0.465	0.194	0.333	0.103	-0.270	0.156	-0.018
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.37)	(0.00)	(0.67)

Table 3 (continued)

	Ak	Alternatif	Atlas	Atlantis	Avrasya	Ata	Baskent	Bumerang	Deniz
Garanti	0.041	0.419	0.481	0.738	-0.320	0.418	0.466	0.640	0.537
	(0.40)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hedef	0.328	0.293	0.437	0.320	0.353	0.149	0.488	0.109	0.265
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.16)	(0.00)	(0.31)	(0.01)
Info	0.563	0.725	0.273	0.822	0.257	0.005	0.147	0.639	0.746
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.95)	(0.29)	(0.00)	(0.00)
Is	0.913	0.590	0.213	0.277	-0.007	0.226	0.340	0.129	0.010
	(0.00)	(0.00)	(0.00)	(0.00)	(0.86)	(0.00)	(0.01)	(0.00)	(0.81)
Metro	0.276	0.478	0.531	0.653	0.598	0.015	0.126	0.304	0.265
	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.91)	(0.36)	(0.02)	(0.05)
Mustafa Yilmaz	0.050	0.203	0.289	0.512	-0.061	0.324	0.621	0.817	0.819
	(0.31)	(0.00)	(0.00)	(0.00)	(0.15)	(0.00)	(0.00)	(0.00)	(0.00)
Oyak	-0.782	-0.385	-0.550	-0.814	-0.690	0.149	-0.859	-0.248	0.061
	(0.01)	(0.31)	(0.12)	(0.01)	(0.04)	(0.70)	(0.00)	(0.52)	(0.88)
Tac	0.200	0.011	0.066	0.201	-0.120	0.120	0.476	0.047	0.248
	(0.00)	(0.80)	(0.13)	(0.00)	(0.01)	(0.01)	(0.00)	(0.28)	(0.00)
Tacirler	0.590	0.514	0.650	0.337	0.395	0.814	0.586	-0.040	0.719
	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.78)	(0.00)
Taksim	0.357	0.109	0.518	0.383	0.424	0.204	0.541	-0.048	0.146
	(0.01)	(0.42)	(0.00)	(0.00)	(0.00)	(0.13)	(0.00)	(0.72)	(0.28)
TSKB	0.615	0.793	0.306	0.695	-0.266	0.326	0.547	0.683	0.659
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Varlik	-0.057	0.079	0.234	0.265	-0.236	0.238	-0.306	0.162	(0.00)
	(0.24)	(0.09)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.87)
Vakif	0.325	0.158	-0.062	0.036	0.201	-0.143	0.123	-0.106	-0.018
	(0.00)	(0.00)	(0.13)	(0.38)	(0.00)	(0.00)	(0.38)	(0.01)	(0.66)
Yapi Kredi	0.536	0.464	0.537	0.595	-0.014	0.419	0.587	0.332	0.213
	(0.00)	(0.00)	(0.00)	(0.00)	(0.75)	(0.00)	(0.00)	(0.00)	(0.00)
Yatirim Finansman	0.397	0.618	0.270	0.545	-0.095	0.213	0.504	0.483	0.419
	(0.00)	(0.00)	(0.00)	(0.00)	(0.06)	(0.00)	(0.00)	(0.00)	(0.00)
VWD	0.882	0.757	0.441	0.534	0.038	0.372	0.550	0.419	0.314
	(0.00)	(0.00)	(0.00)	(0.00)	(0.37)	(0.00)	(0.00)	(0.00)	(0.00)
ISE 100	0.061	0.019	0.069	0.042	0.019	-0.027	-0.086	0.058	0.036
	(0.21)	(0.66)	(0.08)	(0.30)	(0.65)	(0.54)	(0.54)	(0.15)	(0.37)

Table 3
Correlation Coefficients for Weekly Discounts on Closed-End Funds (continued)

	Eczacibasi	Euro	Evg	Evren	Finans	Gedik	Global	Garanti	Hedef
Euro	0.660								
	(0.00)								
Evg	0.530	-0.117							
	(0.00)	(0.40)							
Evren	-0.044	0.119	-0.674						
	(0.36)	(0.39)	(0.00)						
Finans	0.140	0.251	-0.004	0.637					
	(0.00)	(0.07)	(0.97)	(0.00)					
Gedik	0.018	0.250	0.449	0.023	0.268				
	(0.71)	(0.07)	(0.00)	(0.64)	(0.00)				
Global	0.403	-0.256	-0.414	0.375	0.282	0.055			
	(0.00)	(0.42)	(0.00)	(0.00)	(0.00)	(0.28)			
Garanti	-0.054	-0.052	0.753	0.111	0.409	0.470	-0.019		
	(0.26)	(0.71)	(0.00)	(0.01)	(0.00)	(0.00)	(0.66)		
Hedef	0.361	0.035	0.287	0.122	0.202	0.299	(0.01)	0.326	
	(0.00)	(0.80)	(0.01)	(0.25)	(0.06)	(0.00)	(0.97)	(0.00)	
Info	0.751	0.628	0.688	-0.667	-0.185	0.681	-0.451	0.819	0.286
	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.01)
Is	0.672	0.260	0.052	0.099	0.475	0.130	0.072	0.025	0.352
	(0.00)	(0.06)	(0.60)	(0.02)	(0.00)	(0.01)	(0.09)	(0.56)	(0.00)
Metro	0.253	0.533	0.309	0.221	0.350	0.568	-0.140	0.081	0.027
	(0.06)	(0.00)	(0.02)	(0.10)	(0.01)	(0.00)	(0.61)	(0.55)	(0.84)
Mustafa Yilmaz	0.006	0.469	0.794	0.077	0.246	0.927	0.133	0.528	0.271

Table 3 (continued)

	Eczacibasi	Euro	Evg	Evren	Finans	Gedik	Global	Garanti	Hedef
	(0.90)	(0.00)	(0.00)	(0.06)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Oyak	0.799	0.747	0.524	0.682	0.553	0.476	.	0.271	0.054
	(0.01)	(0.02)	(0.15)	(0.04)	(0.12)	(0.19)	.	(0.48)	(0.89)
Tac	-0.089	0.399	0.555	-0.074	0.184	0.384	-0.028	0.095	0.427
	(0.06)	(0.00)	(0.00)	(0.09)	(0.00)	(0.00)	(0.54)	(0.03)	(0.00)
Tacirler	0.714	0.462	-0.567	0.841	0.364	0.480	-0.608	0.671	0.314
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.06)	(0.00)	(0.03)
Taksim	0.073	0.070	0.196	0.295	0.202	0.463	-0.512	0.251	0.316
	(0.59)	(0.62)	(0.14)	(0.03)	(0.13)	(0.00)	(0.04)	(0.06)	(0.02)
TSKB	0.005	0.702	0.709	-0.101	0.406	0.647	-0.226	0.793	0.269
	(0.93)	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Varlik	-0.137	-0.045	-0.084	0.364	0.371	0.050	0.195	0.165	-0.293
	(0.00)	(0.75)	(0.40)	(0.00)	(0.00)	(0.30)	(0.00)	(0.00)	(0.01)
Vakif	0.194	0.397	0.757	-0.141	-0.013	-0.072	0.054	-0.251	0.164
	(0.00)	(0.00)	(0.00)	(0.00)	(0.75)	(0.14)	(0.19)	(0.00)	(0.12)
Yapi Kredi	0.344	0.535	0.546	0.300	0.648	0.306	0.474	0.267	0.277
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Yatirim Finansman	0.206	0.674	0.843	-0.229	0.248	0.405	-0.006	0.614	0.124
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.90)	(0.00)	(0.24)
VWD	0.623	0.584	0.631	0.162	0.588	0.364	0.290	0.284	0.255
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)
ISE 100	0.103	0.094	-0.050	0.067	0.060	0.053	0.116	0.011	0.106
	(0.03)	(0.50)	(0.61)	(0.10)	(0.15)	(0.28)	(0.01)	(0.80)	(0.32)

Table 3
Correlation Coefficients for Weekly Discounts on Closed-End Funds. (continued)

	Info	Is	Metro	Mustafa Yilmaz	Oyak	Tac	Tacirler	Taksim	TSKB	Varlik	Vakif	Yapi Kredi	Yatirim Finansman	VWD
Is	0.440													
	(0.00)													
Metro	0.485	0.136												
	(0.00)	(0.31)												
Mustafa Yilmaz	0.711	-0.031	0.481											
	(0.00)	(0.45)	(0.00)											
Oyak	-0.586	0.812	-0.051	0.908										
	(0.10)	(0.01)	(0.90)	(0.00)										
Tac	0.657	0.112	0.022	0.122	-0.057									
	(0.00)	(0.01)	(0.87)	(0.00)	(0.88)									
Tacirler	-0.130	0.686	-0.104	0.793	0.576	0.551								
	(0.36)	(0.00)	(0.47)	(0.00)	(0.10)	(0.00)								
Taksim	0.196	0.006	0.414	0.308	-0.853	0.145	-0.119							
	(0.14)	(0.96)	(0.00)	(0.02)	(0.00)	(0.28)	(0.40)							
TSKB	0.768	0.673	0.725	0.600	0.466	0.571	0.507	0.320						
	(0.00)	(0.00)	(0.00)	(0.00)	(0.21)	(0.00)	(0.00)	(0.02)						

Table 3 (continued)

	Info	Is	Metro	Mustafa Yilmaz	Oyak	Tac	Tacirler	Taksim	TSKB	Varlik	Vakif	Yapi Kredi	Yatirim Finansman	VWD
Varlik	-0.210	0.019	0.110	0.094	0.834	0.012	-0.174	-0.200	0.042					
	(0.01)	(0.68)	(0.41)	(0.04)	(0.01)	(0.80)	(0.22)	(0.14)	(0.48)					
Vakif	0.384	0.280	0.563	-0.126	0.372	0.198	0.003	0.386	0.010	-0.219				
	(0.00)	(0.00)	(0.00)	(0.00)	(0.32)	(0.00)	(0.98)	(0.00)	(0.86)	(0.00)				
Yapi Kredi	0.577	0.543	0.358	0.232	0.855	0.319	0.742	0.236	0.343	0.165	0.217			
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)			
Yatirim Finansman	0.723	0.415	0.527	0.328	0.048	0.319	0.638	0.268	0.765	-0.024	0.151	0.362		
	(0.00)	(0.00)	(0.00)	(0.00)	(0.90)	(0.00)	(0.00)	(0.04)	(0.00)	(0.63)	(0.00)	(0.00)		
VWD	0.728	0.853	0.452	0.259	0.857	0.228	0.650	0.302	0.784	0.037	0.340	0.700	0.610	
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.42)	(0.00)	(0.00)	(0.00)	
ISE 100	-0.028	0.031	0.307	0.020	0.401	-0.000	0.043	0.077	-0.024	0.038	-0.007	0.050	0.032	0.049
	(0.71)	(0.45)	(0.02)	(0.61)	(0.28)	(1.00)	(0.76)	(0.57)	(0.68)	(0.41)	(0.86)	(0.22)	(0.53)	(0.22)

The pairwise Pearson correlation coefficients between the levels of percentage discount for 31 Turkish closed-end funds calculated from weekly prices and NAVs, the value-weighted percentage discount on all closed-end funds (VWD) and the return on the ISE-100 index are shown. The figures in parentheses represent p-value for a two-tailed test of null hypothesis of zero correlation.

Table 4
Discounts and Market Returns Before the IPO Date of a Fund and During the First Four Weeks of a New Fund's Trading

New Closed-end Funds	Average Discount on the Fund During its First Four Weeks	Average Discount on Existing CEFs Over Four Weeks Before the IPO Date	Average Discount on Existing CEFs Over Four Weeks Before the FTD	Average Discount on All CEFs Over Four Weeks After the FTD	Average Return on ISE-100 Index Over Four Weeks Before the IPO Date	Average Return on ISE-100 Index Over Four Weeks Before the FTD	Average Return on ISE-100 Index Over Four Weeks After the FTD
Ak	23.787	40.449	39.321	43.782	5.265	1.608	-0.809
Alternatif	13.521	39.153	38.542	36.011	-1.116	-0.733	2.590
Ata	1.405	10.094	8.608	3.678	6.734	6.476	0.842
Avrasya	22.200	38.454	38.677	38.710	2.940	2.525	-2.189
Baskent	3.693	22.126	25.829	32.038	-0.143	-3.804	-0.159
Deniz	18.865	24.786	24.868	27.089	4.103	3.064	-2.795
Eczacibasi	40.226	36.718	35.894	45.327	3.009	1.479	10.102
Euro	-15.680	24.776	26.995	34.400	-2.954	-3.814	1.363
Evg	-8.615	30.341	30.349	27.029	1.459	1.977	1.821
Finans	35.950	25.702	22.904	27.273	2.195	-0.646	-0.233
Garanti	23.202	35.878	36.798	35.373	1.844	0.243	1.978
Gedik	15.531	41.818	41.818	41.272	2.768	2.768	4.909

Table 4 (continued)

New Closed-end Funds	Average Discount on the Fund During its First Four Weeks	Average Discount on Existing CEFs Over Four Weeks Before the IPO Date	Average Discount on Existing CEFs Over Four Weeks Before the	Average Discount on All CEFs Over Four Weeks After the FTD	Average Return on ISE-100 Index Over Four Weeks Before the IPO Date	Average Return on ISE-100 Index Over Four Weeks Before the	Average Return on ISE-100 Index Over Four Weeks After the FTD
Hedef	-2.320	17.863	17.860	16.085	2.555	1.255	-1.783
Info	-65.180	5.965	5.966	0.736	2.256	2.256	2.452
Is	-14.867	28.316	25.702	23.627	1.901	2.195	-1.030
Metro	-44.479	23.293	23.576	26.995	-3.210	-3.210	-3.814
Oyak	5.783	41.104	41.602	41.908	2.176	1.768	-0.359
Tac	-1.914	27.853	-9.463	-0.591	-3.322	2.116	-2.322
Tacirler	-10.144	26.995	29.849	37.175	-3.814	0.986	-0.029
Taksim	-42.395	23.293	23.576	26.995	-3.210	-3.210	-3.814
TSKB	32.094	47.843	45.861	38.920	-5.917	4.715	6.343
Varlik	16.877	29.791	28.209	26.814	-0.622	1.850	1.545
Yapi Kredi	12.117	13.672	24.786	27.212	0.167	4.103	-3.378
Yatirim Finansman	1.338	53.539	52.730	44.772	3.945	2.666	2.377

Twenty-four funds started trading during the sample period analyzed in this paper. Average weekly discount on existing funds and the return on the ISE-100 index over a four-week period before the IPO, and before and after the First Trading Day (FTD) of a new fund, and average weekly discount on the new fund over a four week period after its FTD are presented in this table.